

1 Attorney Docket No. 79866

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3 NON-LINEAR AXISYMMETRIC POTENTIAL FLOW BOUNDARY MODEL FOR
4 PARTIALLY CAVITATING HIGH SPEED BODIES
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6 ABSTRACT OF THE DISCLOSURE

7 A method for calculating parameters about an axisymmetric
8 body in a cavity is provided. The user provides data describing
9 the body, a cavity estimate, and convergence tolerances.

10 Boundary element panels are distributed along the body and the
11 estimated cavity. Matrices are initialized for each panel using
12 disturbance potentials and boundary values. Disturbance
13 potential matrices are formulated for each panel using
14 disturbance potential equations and boundary conditions. The
15 initialized matrices and the formulated matrices are solved for
16 each boundary panel to obtain panel sources, dipoles and
17 cavitation numbers. Forces and velocities are computed giving
18 velocity and drag components. The cavity shape is updated by
19 moving each panel in accordance with the calculated values. The
20 method then tests for convergence against a tolerance, and
21 iterates until convergence is achieved. Upon completion,
22 parameters of interest and the cavity shape are provided. This
23 invention also allows determination of cavity shape for a
24 cavitation number.